A1 concl.

image intensity in a light-emitting device whose anode overlies the device's light-emitting regions.--

A2

--**[0017]** The coatings are typically made light reflective by forming them from one or more of the metals beryllium, boron, magnesium, aluminum, chromium, manganese, iron, cobalt, nickel, copper, gallium, molybdenum, palladium, silver, indium, platinum, thallium, and lead, including alloys of one or more of these metals. Boron, aluminum, gallium, indium, and thallium, all of which fall into Group IIIB (13) of the Periodic Table, are attractive for the light-reflective coatings because none of these five metals is an electron donor. Silver and copper are attractive because they are substitutional species in metal sulfide phosphors suitable for implementing the light-emissive particles to respectively emit blue and green light.--



A3

--**[0081]** Light-reflective coatings 74 normally consist of metal. Candidate metals for coatings 74 are beryllium, boron, magnesium, aluminum, chromium, manganese, iron, cobalt, nickel, copper, gallium, molybdenum, palladium, silver, indium, platinum, thallium, and lead. Coatings 74 may contain two or more of these metals or may consist of an alloy of one or more of these metals with one or more other materials. Boron, aluminum, gallium, indium, and thallium, which all fall into Group IIIB (13) of the Periodic Table, are attractive for coatings 74 because none of these five metals is an electron donor. Consequently, each of them is highly unlikely to cause phosphor particles 72 to emit light of the wrong color should atoms of any of these five metals migrate into particles 72.--

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A4

--**[0085]** Phosphor particles 72 may produce contaminant gases when struck by high-energy charged particles, especially electrons emitted by electron-emissive regions 58. For

example, particles 72 may outgas sulfur when part or all of them are metal sulfide phosphors, or oxygen when part or all of them are metal oxide phosphors. When part or all of particles 72 are metal oxysulfide phosphors, they may outgas both sulfur and oxygen. Outgassed sulfur can be in the form of atomic/molecular sulfur or/and in the form of sulfur-containing compounds. Sulfur, although a solid at standard temperature (0°C) and pressure (1 atm.), is gaseous at the high vacuum, typically a pressure of $10^{-6}$ torr or less, present in the interior of the display of Fig. 4 and 5. Unless these contaminant gases are prevented from leaving the immediate vicinity of particles 72, the contaminant gases can enter the interior of the display and cause damage.–

A4 concl.



--**[0087]** Coatings 74 may, in accordance with the invention, consist of one or more of the following metals provided over particles 72 to a thickness below that needed for adequate light reflection: beryllium, boron, magnesium, aluminum, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, gallium, zirconium, niobium, molybdenum, palladium, silver, indium, barium, tantalum, tungsten, platinum, thallium, lead, and thorium, including alloys of one or more of these twenty-six metals. Alternatively or additionally, coatings 74 may consist of oxide one or more of magnesium, chromium, manganese, cobalt, nickel, and lead. When coatings 74 are implemented with one or more of these six metal oxides, coatings 74 normally provide the protective shielding function even though they may not furnish adequate light reflection.--

A5

--**[0158]** An optional protective (or isolation) layer 90 is situated on black matrix 68 and extends substantially all the way down its sidewalls. The combination of faceplate 64 and protective layer 90 encapsulates matrix 68. When electrons emitted by regions 58 strike light-emitting device 80, the

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KV

A6 cont.

polymeric material which typically forms upper layer 88 of matrix 68 can emit contaminant gases. Protective layer 90 slows the entry of these gases into the interior of the display. Further details on protective layers such as layer 90 are presented in Haven et al, U.S. patent application 09/087,785, filed 29 May 1998, now U.S. Patent 6,215,241, and in Curtin et al, U.S. patent application 09/698,696, filed 27 October 2000.--

A7

--**[0164]** In conjunction with having reduced chemical reactivity compared to the native aluminum oxide layer, layer 102 has a lower gas-sticking coefficient than the native oxide layer. Consequently, the likelihood of contaminant gases adhering to the interior surface of the active portion of light-emitting device 80 is reduced compared to what would occur if the interior surface of the active portion were formed with the native aluminum oxide layer. Further details on layers such as additional layer 102 are presented in Cummings et al, co-filed U.S. patent application 09/823,872.--

A8

--**[0240]** Part of the phosphor-emitted rear-directed light passes through intensity-enhancement coatings 112, is reflected off light-reflective coatings 74, passes through phosphor particles 72, and then passes through faceplate 64. This can further increases the light intensity in the forward direction. Coatings 74 and 112 can thereby produce an increase in the display's image intensity. Accordingly, the combination of coatings 74 and 112 and layer 70 can provide greater forward light intensity and image intensity than would occur solely with layer 70 or solely with coatings 74 and 112.--

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